DOCUMENT RESUME

ED 150 823 EC 104 188

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TITLE Educational Programming for the Severely Multiply Handicapped.
INSTITUTION Council for Exceptional Children, Reston, Va. Div. on Physically Handicapped, Homebound and Hospitalized.
PUB DATE 77
NOTE 49p.
AVAILABLE FROM The Council for Exceptional Children, Division on Physically Handicapped, Homebound and Hospitalized, 1920 Association Drive, Reston, Virginia 22091 ($4.00)

EDRS PRICE MF-$0.83 HC-$2.06 Plus Postage.
DESCRIPTORS *Class Activities; Communication (Thought Transfer); Educational Methods; Elementary Secondary Education; *Learning Activities; *Multiply Handicapped; *Severely Handicapped; Speech Instruction; *Teaching Methods

ABSTRACT

Discussed are educational guidelines and techniques for severely multiply handicapped children. Initial sections review characteristics and appropriate educational goals for the population. General teaching approaches are described, and specific suggestions are given for the following areas (subtopics in parentheses): positioning (effects of reflex responses); speech and language (phonological development, alternatives to spoken language); the classroom teacher's role in speech and language development (training attention and imitation, developing body awareness); basic concept formation; and communication skills. The booklet concludes with a listing of nine basic activity descriptions, including music, art, and design printing tasks. (CL)

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EDUCATIONAL PROGRAMMING FOR THE SEVERELY MULTIPLY HANDICAPPED

by

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Written under the auspices of

Ad Hoc Committee on Programs for the
Severely Multiply Handicapped

Division on Physically Handicapped
Homebound and Hospitalized

The Council for Exceptional Children

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Introduction

There is general consensus among leadership in the field of Crippled and Other Health Impaired (COHI) that changes in the target population have occurred and continue to occur (Connor, Wald & Cohen, 1971). The children currently receiving services in special education programs are more severely handicapped than those who had previously been accepted in special programs. Today, COHI pupils include those who manifest multi-sensory deficiencies, perceptual inadequacies, communication barriers, social and emotional complexities and retarded intellectual ability. Stainback, Stainback, and Maurer (1976) noted that until the past few years these children could be found primarily "on the back wards of large state institutions" (p. 47).

There is a growing body of law affirming the educational rights of handicapped children. Lippman and Goldberg (1973) noted that as a result of the Pennsylvania case, which holds that no child can be denied the right to an education, there is a greater concern for the excluded child than there has ever been before. The Division on Physically Handicapped, Homebound and Hospitalized of the Council for Exceptional Children (DOPHHH) is increasingly concerned with the provision of educational services to severely handicapped populations. For while there appears to be greater awareness of the zero reject system of free public education, much remains to be accomplished before adequate educational opportunities can be provided to all children. It is because of this concern that DOPHHH formulated its Ad Hoc Committee on Programs for the Severely Multiply Handicapped. This short publication is one of the outcomes of the Committee's work.

It is the intent of this manuscript to present an overview of those skills and knowledges felt to be important for persons engaged in educational programming for the severely handicapped. Briefly, the text defines the severely handicapped child, his needs, and how his learning is best effected. Specific instructional activities are given as examples. In focusing attention on key areas it is hoped that the reader will assess his own strengths and possible need for professional development. It is DOPHHH's objective that teachers of crippled and other health impaired populations will be accepting of this more profoundly involved group and will equip themselves with the skills necessary to make instructional decisions applicable to the needs of these children.

Joan Wald Baken
for the DOPHH Ad Hoc
Committee on Programs for
the Severely Multiply Handicapped

The Population

The population of multiply handicapped children who are the focus of this publication manifest severe physical impairment as well as profound developmental disabilities. They commonly show deficits in attention and in the ability to respond to social stimuli. In general, these children do not speak, imitate, follow directions, play, or control their own behavior.

The literature is replete with statements describing the severely handicapped as passive, hyperactive, impulsive, rigid, suggestible, withdrawn and developmentally immature. Observation indicates that all of these statements can be substantiated. Sontag, Burke, and York (1973) described these children as those who self-mutilate, regurgitate, ruminate, aggress towards others, display stereopathics, manifest durable and intense temper tantrums, have serious seizures, and/or have extremely brittle medical existences. Also included in this population are those children who do not suck, swallow or chew, imitate, ambulate, speak, see, toilet themselves, respond to simple verbal commands and/or possess multiple physical handicaps.

The factors contributing to the clinical syndrome referred to as severely handicapped are multifold. Deficits in function may be the result of biological, psychological, and/or sociological factors. Organic impairment often brings with it concomitant sensory and perceptual impairment and the inability to retain information. Limitations and aberrations of motor function also contribute toward both disturbances in perceptual analysis and functional retardation. As an infant, the physically normal child begins to perceive and appreciate the physical relationships and personal implications of his environment. For the physically handicapped youngster, inability to move limits and sometimes precludes this early exploration and sensory experimentation.

A multiplicity of secondary functional deficits may result. Time spent staring at the ceiling reinforces a self-contained world and undifferentiated object relations. A sound is heard. But, by the time the child has organized the motor response necessary for locating the source of that sound, the moment has passed and the stimulus is no longer available for examination. It is suggested that impaired ability to make emotionally significant distinctions between familiar and unfamiliar, between friends and strangers, between persons, places, and objects results from exposure to limited stimuli and the inability to respond to those stimuli which are present.

Psycho-intellectual deficits imply slowness to learn and difficulty dealing with abstractions. Severely handicapped youngsters are often limited in their ability to learn without direct intervention. Because psychological abilities are often impaired the environment may need to be reduced to those key stimuli to be learned. Experiences at all developmental levels need to be repeated more often than for moderately or mildly handicapped. And, even with repetition, experiences are likely to remain unconnected with generalizations being made by the youngster only if they have been specifically taught.

It is suggested that the ability of a severely handicapped child to show maximum achievement relative to his own potential is also influenced by the behavior of other significant persons in the immediate environment. Overt rejection of or simple lack of involvement with the multiply handicapped child may contribute to a lowered level of function. Overprotection may serve to limit the child's chances to explore in whatever limited ways he may have available to him.

As a result of his multiplicity of handicaps (both primary and secondary) it might be said that the severely handicapped child is faced with an inconsistent confusing environment to which he cannot respond and which he is very likely to soon ignore. The child's own slow rate of development accompanied by the limited attention paid to him in other than dependent roles often leads to a prolonged infancy stage which reinforces sensory experiences such as self-touching and hand-to-mouth exploration. The behavior often observed when the severely handicapped child enters a habilitation program is that of affective unavailability; a refusal to interact with other persons often accompanied by self-stimulating stereotyped gestures. Exploration of the environment, if it exists at all, is at the level of licking and smelling objects. Many severely handicapped youngsters seek or respond to external objects only in terms of immediate primary gratification.

Setting Educational Goals

It is foolish to think that severely handicapped children will approximate normal, or in fact, will ever gain full independence. Often, these children do not have the potential to be trained in total self-care and full socialization. Even as adults, continuous help will most likely be needed in taking care of personal needs. It is suggested, however, that educational goals can be set which allow each severely handicapped client to achieve limited improvement in overall level of function.

Within the confines of a protected environment, whatever small advance seems within the individual's potential should become a working goal. Stainback et al. (1976) noted that "even the more profoundly handicapped. . .has the potential for learning, among other things, visual and auditory awareness, motor control of the head and trunk, and a rudimentary understanding of vocabulary" (p. 204).

As the child or individual moves up the developmental scale his economic usefulness (i.e. that contribution which the individual makes to the immedaite environment) increases. Many of the tasks learned by the severely multiply handicapped will have their economic usefullness in the fact that they make the job of the primary caretaker somewhat easier. The youngster who has learned to keep food in his mouth while being fed requires less maintenance time than the child who thrusts his food outward, takes longer to feed, and must be washed and changed afterward. In addition, it is suggested that a reduction in the amount of time spent in meeting personal health needs may be reflected in an increase in the amount of time available for teaching new skills.

Regardless of chronological age, the individual who is functioning at infant levels interacts with the environment only in so far as it meets his primary needs. However, if over time he can be brought to the functional level of a five year old, the individual can be expected to learn things about himself and about the consequences of his behavior. He has the capacity to understand a token system for modifying behavior and is able to learn small tasks which ease the burden of daily care assumed by other persons. The individual functioning at the level of a five year old is independent in toileting. In general, using speech or an alternate form of communication, he can indicate physiological needs and/or distresses, and he can learn to make meaningful discriminations which focus on safety and the recognition of danger signals.

In general, then, it appears that the long range educational goal is to move the severely handicapped individual slowly along the developmental scale bringing him through those stages which Gesell and Amatruda (1947) referred to as maturity age zones. An initial evaluation using one of the many instruments available for assessing developmental levels (Bayley, 1969; Cohen, Gross, & Haring, 1976; Frankenberg, Dobbs, & Fandal, 1970; Sailor & Mix, 1975) provides a rough approximation of which skills the pupil possesses, which need extra work, and which do not exist at all. Beyond this approximation any judgement about what the student should learn first will be, to some extent, a value judgement. For this reason it is suggested that the selection of target objectives be a team decision and that the child's parents and/or primary caretaker be included in the decision-making process.

Many of the atypical behaviors presented by severely involved youngsters mitigate against social interaction and engagement with the teacher/therapist. Therefore, it seems safe to suggest that the clinician's first educational goal is to eliminate maladaptive, disruptive behaviors and institute more appropriate responses to environmental stimuli. Beyond this point items which constitute curricula for the severely handicapped appear quite similar to the developmental norms prescribed for infants.

Developmental milestones such as lifting the head, visual tracking, and reaching for objects are often part of the curriculum for severely and profoundly handicapped. Similarly, head and trunk balance, differentiated movement of body parts and oral motor acts form the basis of program emphasis (Meyers, Sinco & Stalma, 1973).

At higher levels, the major educational objectives of a program for the severely handicapped focus upon the development of imitative skills from which stem the more complex tasks of following directions and making visual, auditory, and tactile discriminations. As the child moves slowly along the developmental scale, it should be remembered that specification of new responses which the pupil will perform at the end of the teaching process should be aimed toward the development of self-help behaviors such as eating, toileting and communicating.

Instructional Methodology

The process of training the severely handicapped individual is, as might be expected, a belaboured one. Even with continued habilitative training the developmental level of the severely involved child falls further and further behind that of his chronological age peers. Because the profoundly disabled student cannot be expected to generalize across situations or to "learn by living" each new behavior must be learned separately. Assuming an overall rate of development that is often less than one-fourth that of a normal individual (IQ 20), the severely handicapped child of four years of age might be expected to function at the level of a one year old. At this same rate of development, by chronological age twenty he had theoretically progressed to a mental age of only five years.

Across all therapies, instruction of the severely involved student usually follows a sequence of choosing a target behavior, analyzing and sequencing the components of that behavior, selecting and implimenting a reward system which reinforces the desired response, and monitoring changes in behavior. Because severely handicapped youngsters often have deficits in figure-ground perception, it is suggested that for all educational/therapeutic objectives, the teaching setting should be arranged so that all irrelevant and competitive stimuli are reduced to a minimum. In fact, teaching the pupil to function in a increasingly distractible setting is often a major educational goal.

In general, programming for severely handicapped populations follows the processes developed and practiced in diagnostic/prescriptive teaching and behavior analysis. Haring, Hayden, and Beck (1976) suggest the following set of rules as particularly relevant for effective teaching of the severely handicapped:

1. Measure entering behavior (developmental level).
2. Specify terminal behavior (the particular skill or set of skills to be learned).
3. Require an active response by the pupil.
4. Arrange small, sequential steps to achieve the terminal behavior in order to maximize the opportunities for success.
5. Build in periodic review of skills already learned (for instance through drill and practice).
6. Withdraw discriminative stimulus systematically by shaping generalization and differential discrimination skills.
7. Systematically measure progress throughout program (precise data collection). (p. 2)

Once instructional objectives have been specified, (see Section II) moving the child forward requires a clear logical sequence of tasks, each of which is subdivided into minute teachable tasks. Drawing on reason, experts, curriculum guides, and past experience, the teahcer formulates a theoretical breakdown of the terminal objective (Bateman, 1971). Continuous revision based on the pupil's actual performance allows the teacher to move quickly through component tasks which have been previously mastered as well as perform an increasingly finer analysis on those steps the pupil is unable to master as stated.

Most responses will be learned only through habit training. Applied at its simplest level, teaching becomes the establishment of a condition which the child recognizes as familiar. In addition, he remembers that if in this setting he acts a specific way, something nice happens to him. For the severely and profoundly retarded, complex behaviors are usually organized into a series of small discrete units each of which is taught independently. As individual skills become stabilized they are then chained together in sequences of increased length. Primary reinforcement and physiological prompting can be used to provide the learner with feedback information about how a correct response feels and looks. Demonstration, passive patterning, prompting and availability of correct models become significant instructional methods. In some cases it is necessary to design and/or build prosthetic devices to aid children in performing simple tasks (Bigge, 1970; Robinault, 1973).

The importance of motivational variables should not be overlooked. Even severely retarded persons appear to be responsible to variations in incentive conditions. It is suggested that for all chosen objectives, the teacher/therapist, by manipulating the environment consistently and meaningfully, can foster self-realization and the formation of relationships which lead to the learning of new responses.

After the selection of specific objectives, the selection of an appropriate reward is probably the most important decision to be made in the teaching strategy. Simultaneous with the pinpointing of behavior to be changed the teacher must engage in observation of events that might be used as reinforcements to maintain, increase, and decrease a given behavior. On initial evaluation many severely handicapped youngsters respond only to a primary reward system. It is therefore suggested that one of the first "lessons" of a training program be the alteration of the reward system so that secondary social reinforcers (e.g. smile, hug, other physical contact) acquire the reinforcing properties of a primary reward system.

Once level of present function is determined, teaching tasks analyzed and reinforcements chosen, the evaluation process becomes essential in establishing the successful completion of an instructional objective. Behvaioral change should provide needed input relative to the effectiveness of the chosen strategies and/or reward. However, because of the small achievement increments over time, precise measurement of behavior becomes extremely important (Lindsley, 1971). Behavioral charting procedures provide a visual means of recording frequent and direct measurement of desired responses.

Quantification of change in pupil behavior may be determined by change in developmental level of response, response rate data, or trials to criterion. Continuous assessment ensures that the teacher will note instructional failure more quickly by reducing the time lapse between student difficulty, recognition of that difficulty and meaningful intervention.

The pupil's inability to reach the specified terminal objective may result for a variety of reasons. Alternatives facing the teacher include further breakdown of the task, selection of a different teaching strategy (e.g. modeling, prompting, conditioning), or selection of a different reinforcer. Regardless of which intervention is selected, frequent assessment allows the teacher to determine the affect of the new program on pupil behavior and alerts one to the need to make additional changes as necessary.

Positioning for Optimal Learning

The population of individuals with severe multi-handicapping conditions includes a large number of children with neuromuscular impairments resulting in limitations in head, neck, and body control. Because of the severity of the children's physical handicaps it is suggested that teachers working with this population acquaint themselves with the use of body positioning to maximize learning (Finnie, 1970; Mysak, 1968). Often, individuals with central nervous system pathologies demonstrate continued presence of primitive reflexes and/or the failure to develop control of volitional movement. Depending upon the site of the lesion, these individuals demonstrate primitive patterns of abnormal flexion and extension which inhibit normal body posture and foster orthopedic deformities which further preclude function (Bobath, 1966). According to Connor and Baken (1976) the presence of these abnormal patterns often interferes with attention to stimuli, perception of stimuli and voluntary control of responses to stimulus input.

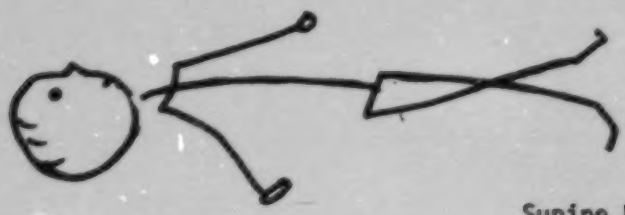
The Effects of Reflex Responses

Labyrinthine Reflex

Normally active from birth to six months of age, the labyrinthine reflex provides the infant with information related primarily to the face-lying (prone) and back-lying (supine) positions. When the infant is placed in the prone position increased flexor tone is observed. Hips, knees, and elbows are bent and drawn close to the body. Hands are fisted. An abnormal and persistent prone flexion reflex results in a characteristic posture which inhibits the child from lifting his head and chest, supporting his weight on his arms, and learning to creep. In prone flexion position both visual and manual exploration of the environment is limited.

Prone Flexion Response

In supine position the infant manifests increased extensor tone. Beyond the normal period of six months children begin to assume a position in which head and shoulders are extended backward, back, hips and knees are rigidly straight, arms are rotated outward and legs are rotated inward and often crossed. Because the head is thrown back, the mouth is often held open. In the abnormal supine extension position, independent sitting is prohibited and, as in the prone flexion response, visual and manual exploration of objects is limited. In addition, the persistent open mouth posture may result in drooling as well as in difficulty sucking, swallowing and/or chewing.



Supine Extension Response

Asymmetric Tonic Neck Reflex

Normally present and observed in the child from one to four months of age the asymmetric tonic neck reflex (ATNR) provides the infant with a sense of laterality. When the head is turned to one side or other there is an increase in flexor tone on the face side and an increase in flexor tone on the skull side. The arm toward which the face is turned is outstretched and provides a visual target for early eye focus. The other arm is bent at the elbow with the hand near the back of the head. When the ATNR fails to diminish at an appropriate age it interferes with the child's ability to use both hands together as well as to coordinate the efforts of eyes and hands. At early stages, hand to mouth activities are effected since flexion of the elbow causes the head to assume a reflex posture such that the face is turned away from the bent arm.

Asymmetric Tonic Neck Reflex

Minimizing the Effects of Abnormal Reflex Activity

As noted in the examples above, the relationship between reflex patterns and availability for learning is a close one. For maximal learning to be assured it is important that the individual be positioned in a way that minimizes the negative effects of primitive reflexes. Pre-positioning can be used to facilitate improved performance by the so-called "floppy" (hypo-tonic) child as well.

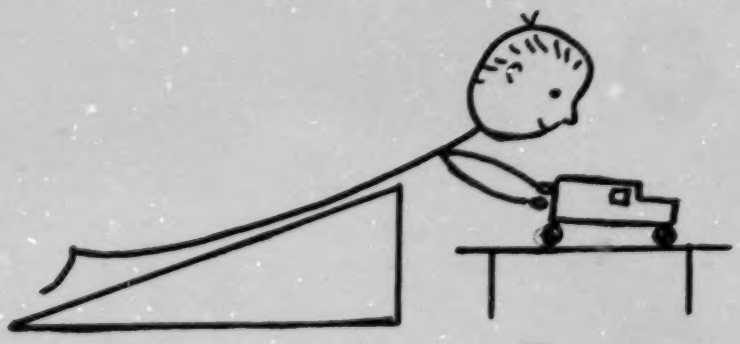
Each of the primary positions (prone, side lying, sitting) depicted below has a large number of alternatives for implementation. Each provides a different kind and degree of assistance to the learner and each has different prerequisities for its use. For the educational programmer, positioning of the severely handicapped youngster has as its goal the liberation of body parts for use in learning activities. It is suggested, however, that teachers be guided by the physical therapist when selecting the most appropriate positions for a given child.

Side Lying Position

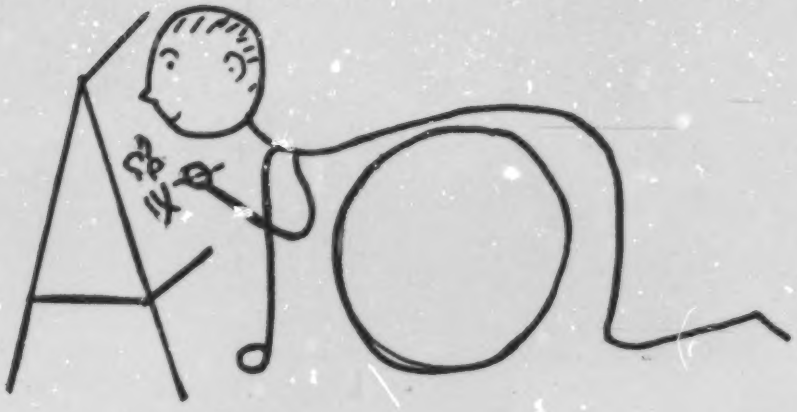
The side lying position places the child in a flexed posture thereby inhibiting both the labyrinthine supine extension response and the ATNR. Bilateral use of hands in a midline position is facilitated as is visual tracking and eye-hand coordination.

Prone Position

By inhibiting such responses as the labyrinthine reflex and the ATNR, the use of a slant board, wedge, or chest roll facilitates lifting the head and chest, using hands at midline, and coordinating the use of hands and eyes.

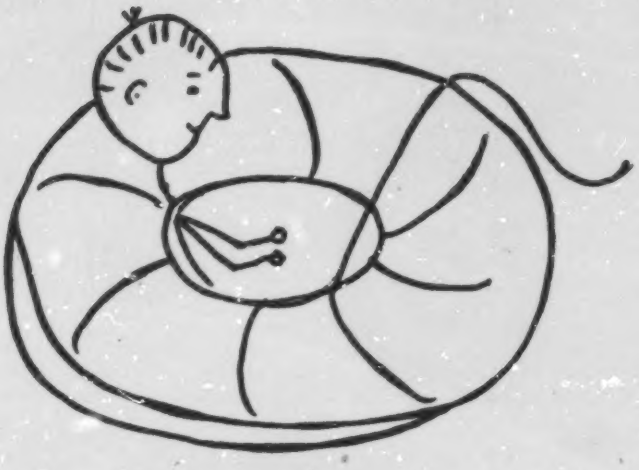


Alternate Prone Positions

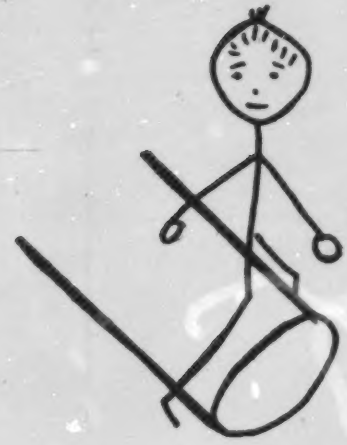


Sitting Position

Modified sitting positions and prosthetic adaptations provide severely handicapped youngsters with the physical support for learning postural control (e.g. independent sitting) as well as with a means of using eyes and hands in constructive and adaptive ways. In general, modifications provide neck and trunk support to facilitate head balance. Providing flexion at the knees and/or a raised work surface are other techniques sometimes employed to inhibit an extension response. Floor sitting either with or without pelvic restraint allows the child to lean in all directions to reach for objects.



Alternate Sitting Positions



SPEECH AND LANGUAGE

By

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Components of the Speech Act

Speech, which is under higher cortical control, is a complex motor act requiring precise coordination of the respiratory, phonatory and articulatory systems.

Respiration

The respiratory system is considered the power source for speech production. Air pressure and flow, generated by precise control of the respiratory musculature, is necessary to initiate and sustain functioning of the pressure-sensitive larynx. Speech breathing requires even further coordination than is needed for normal quiet breathing. During speech breathing, short inspiration must be followed by extended controlled expiration to support connected speech. Studies of infant respiration (Langlois & Baken, 1976; Wilder & Baken, 1975) have reported that the coordination required for the speech respiratory pattern is usually observable by eight months of age.

Phonation

A delicate balance of air pressure is required to produce and maintain voice. Phonation requires coordination of the laryngeal valve while air pressure and flow are furnished by the respiratory system. Not only must voice be produced, but it must also be coordinated for easy onset and termination depending upon the requirements of the spoken message.

Articulation

Given functional respiration and phonation, speech requires movement of the articulators (e.g. lips, tongue, mandible, velum) to produce speech sounds that can be understood by the speaker's linguistic community. Precise coordination is required to produce the rapid movements needed for continuous speech.

Language

Language is a symbolic code used to express ideas and thought to others. One decodes the language of the speaker to extract meaning and encodes thoughts to another person. This discussion will mainly be concerned with

This discussion will mainly be concerned with spoken language although manual and graphic expression are viable alternatives. Development of language may be described in terms of three functional systems: phonological, syntactic, and semantic. Each of these systems is rule-governed and developmental stages for each have been described in the literature (Berry, 1969).

Phonological Development

Phonology includes the study of the phonetics and phonemics of a language. In combination they provide a sound rule system used both in decoding and encoding messages. For example, one distinguishes the word "toy" from the word "boy" on the basis of the initial phoneme. Phonetic discriminations are made when the individual hears the difference between the /t/ in "toy" and the /t/ in "button".

Sound pattern rules have been studied extensively (Chomsky & Halle, 1968). Recent research (Eimas, 1971) has shown that infants begin to discriminate between speech sound during the first few months of life. In order to extract meaning from the continuous speech presented in the environment the youngster must be able to hear and decode phonological structure. And, indeed, during that crucial first year, the normal child begins to associate speech sounds and speech patterns with meaning.

Syntactic Development

Syntax is concerned with the way in which words are arranged in an utterance and the manner in which the child develops a grammar with which he can decode and encode utterances. The differentiation between "the boy was running" and "was the boy running?" is made through application of syntactic rules.

Semantic Development

Semantic development is concerned with meaning in language. Initially, word meaning is widely generalized. With increased experiences a given word becomes more specific in meaning. For example, the child may begin by using "cat" to describe all four-legged animals. As the child is exposed to a variety of four-legged animals he begins to differentiate their characteristics and the specific features of "cat" lead to more specific word meaning. Through exploration of the environment, people, objects, and actions meanings are differentiated and a lexicon is expanded.

Effects of Handicapping Conditions on Speech and Language

Once the requirements for speech coordination are fully understood, the limitations on speech engendered by severe neuromuscular disorders become more apparent.

Respiration in the severely involved child may be characterized by shallow or oppositional patterns due to muscular incoordination. Respiration may be further effected as a result of the poor head, neck, and thoracic balance that is often observed in the severely physically handicapped. Alone or in combination these factors may result in an inability to sustain air flow as needed for the speech act.

Inadequate control and coordination of the laryngeal musculature sometimes lead to an inability to coordinate respiratory and phonatory mechanisms. Problems related to onset and termination of voice as well as difficulty with sustained phonaton may result.

Articulation is affected by poor coordination and inadequate control of the articulators. Persistence of infantile oral reflexes may also interfere with coarticulation (i.e. the ability to move from one speech sound to the next in smoothly executed movement patterns).

Phonological development in the severely physically handicapped child may be impaired for various reasons. Hearing loss may interfere with speech sound reception. Depending upon the severity of the loss the child's ability to use the full range of speech sounds in the encoding process may be affected. Visual impairment, postural deformity and/or poor positioning may inhibit the child's ability to view the speaker. As a result, much of the information conveyed by the position of the speaker's articulators will be lost. Limitations in movements of the articulators may also interfere with the child's ability to produce speech sounds. For example, the child who cannot effect bilabial closure due to lip retraction will encounter great difficulty in production of /p/, /m/, and /b/. Speech, then, as a mode of language transmission becomes less effective.

Mental retardation or damage to areas of the brain serving speech and language may restrict development in all areas of language function. In addition, the severely handicapped child is often restricted in exploration of the environment. He may not be able to observe, touch and manipulate objects, or to perform adequate responses to given stimuli. Word meaning may be more concrete as a result of the experiential deprivation and possible cognitive impairment. This concreteness will be reflected in both the decoding and encoding processes.

In summary, the speech complex serves as the major system through which language is transmitted. Even the child who has a well-developed syntactic rule system and/or an age appropriate lexicon may not be able to encode multiword utterances due to restrictions of the respiratory-phonatory-articulatory complex.

Alternatives to Spoken Language

To increase the communication skills of children who are severely restricted in respratory-phonatory-articulatory functioning, communication

boards are suggested. If the child can be taught to point to pictures, words, or symbols a simple board can be constructed which will allow for the expression of basic daily needs. More complex interface systems have been developed for those children who are restricted on their ability to point or gesture (Vanderheiden & Grilley, 1975). In planning and designing a communication board it is often helpful for the parent and teacher to jointly select those home and school activities which should be represented on the board.

The Classroom Teacher's Role in Speech and Language Improvement

Since the teacher spends a great deal of time with the severely handicapped child, it is suggested that he might serve an important role in diagnostic trouble-shooting as well as in program planning for communicative development. The teacher can be one of the most important program team members; identifying specific problems that may interfere with the speech/language learning process.

Classroom observation is a critical part of the overall diagnostic process and often provides answers to the following types of questions:

1. Does the child respond to voice at varying distances?
2. Does the child respond to environmental noises and/or show the ability to track and localize these sounds?
3. Does the child appear to have word-finding difficulty? Does the same problem occur when words have been specifically taught to the child?
4. Does the child have a short auditory memory?
5. Does the child confuse word order or display confusion as sentences increase in length?
6. When the child has difficulty comprehending a message can it be broken down to a level that can be understood?
7. Does the child show evidence of visual impairment which might interface with reception of phonological cues, observation of features in the environment, etc.?

In settings in which severely handicapped youngsters are functioning at infant levels (i.e. 0-16 months), the teacher's role in speech/language habilitation centers on the development of a basic response system through which the child will be able to express daily needs. In these cases the following diagnostic questions become essential:

1. Does the child attempt to communicate basic needs through gross gesture or vocalization?

2. Is the child able to point to desired objects?

3. Does the child indicate, through facial expression, awareness of environmental stimuli?

4. Has the child developed a basic yes/no response system?

If answers to the above questions are no, the teacher's first goals for speech/language improvement become the establishment of these behaviors. Together with other therapists the teacher works toward a consistent response to stimuli in the environment.

INSTRUCTIONAL ACTIVITIES

It is beyond the scope of this publication to define long range sequential curricula for the severely handicapped. Rather, it is suggested that the reader refer to any of the developmental schedules commonly in use (Bayley, 1969; Frankenburg et al., 1970; Gesell & Amatruda, 1947; Sailor & Mix, 1975). The learning areas and activities which are suggested in the following sections are intended only as examples of the direction of instuction for the severely handicapped. Task difficulty ranges from infant to pre-school level and not all tasks are meaningful for all children.

The reader is asked to remember that the definition and selection of educational objectives have their value primarily in the meaning of the objectives for a specific learner. Similarly, the sequencing of behavioral components and the selection of reinforcement schedules assume greatest significance in the on-site teaching situation.

Training Attention and Imitation

Deficits in attention are common among severely handicapped populations. Some individuals appear totally unaware of the surrounding environment while others are extremely hyperactive and respond haphazardly to a multitude of stimuli. In many cases, severely handicapped persons must be taught to scan the immediate environment as well as to select and act upon that which is of consequence.

Extinction of inappropriate repetitive and/or self-destructive behaviors is often the first step in development of meaningful attending behavior. Before embarking upon an individual teaching plan, it is suggested that the teacher spend time carefully analyzing the target behavior of a given child the context in which undesireable responses occur and the consequences of these behaviors. A certain room, a specific chair, a time of day, or the presence/absence of a certain person is sometimes found to be the precipitant of unacceptable behavior. Other times the rewarding consequences lie in the responses of others (e.g. the sympathetic hug received by the veteran head banger). Often, self-stimulation is the individual's sole reinforcement.

It is the objective of the plan outlined below to teach the individual to attend to the teacher and, at a higher level, to imitate simple behaviors. Note that the first stage of instruction is the extinction of self-stimulating behavior. The basic instructional procedure utilizes a system of rewarding acceptable behavior when it occurs. It should be recognized that at any point in this teaching outline the desired response may not be available in the child's repertoire. When this is the case, it becomes necessary for the teacher to prompt (teach) the desired behavior and then reward its occurence. Responses which are no longer considered to merit a reward are simply ignored in favor of a higher level response. Also note that at each stage the learner is reintroduced to a secondary reward system.

The reader is reminded that the skeleton below exists in the absence of a time frame. Achievement increments may need to be measured in minutes for some children, in seconds for others. The individual's rate of learning will determine the length of the fixed interval noted below and the speed with which the teacher can transfer the learner from a primary to a secondary reward system and from a fixed to a random reinforcement schedule. Some individuals will, with a few weeks, form the associations necessary for establishing new patterns of behavior. Others may take up to a year or longer.

Extinction of Body Rocking (Stage I)

Learner's Behavior	Teacher's Response	Expected Change in Learner's Behavior
(1) body rocking	ignore behavior	continuation of rocking behavior
(2) intermittent cessation of rocking	primary reward given only during periods of cessation	increase in number of times the learner stops rocking
(3) increased frequency of intervals in which rocking is absent	primary reward given only when learner sits still for (two) seconds or more (gradual increase of time in which learner must sit still to earn a reward)	increased duration of intervals in which the learner sits still
(4) sits still in presence of teacher if given primary reward at fixed intervals	pair primary reward with secondary reinforcement such as a hug	sits still in presence of teacher if given social reinforcement at random intervals
(5) sits still in presence of teacher if given secondary reward at fixed intervals	secondary reward (hug) given at random rather than fixed intervals	sits still in presence of teacher if given social reinforcement at random intervals

Training Attention (Stage II)

Learner's Behavior	Teacher's Response	Expected Change in Learner's Behavior
(6) sits still in presence of teacher if given social reinforcement at random intervals	random secondary reinforcement given for sitting still	no change
(7) does not attend to stimulus such as a mechanical toy while sitting still	use of verbal directive "look" to gain attention (if learner attends, even momentarily, primary reward is given and step 8 below is not needed)	no response to verbal cue
(8) sits still in teacher's presence but shows no response to visual stimulus or to verbal demand to "look"	use of verbal directive accompanied by physical prompting (i.e. head positioning and primary reward	increase in number of times learner moves his head in order to look at the stimulus with reduced physical prompting by the teacher but with continued verbal direction and primary reward
(9) when directed to "look" the learner sits still and looks at the stimulus in anticipation of a primary reward	primary reward given during periods of looking (fixed interval of reward is gradually increased - see Stage I, steps 2&3)	increase in number of times learner looks at stimulus as well as increased duration of each interval in which learner attends when verbally prompted
(10) sits still and when so directed attends to visual stimulus until primary reward is given	pair primary reward with secondary reinforcement (e.g. teacher's hands on learner's shoulders	sits still and when directed attends to stimulus if given secondary reward at fixed intervals
(11) responds to directive "look" if given social reward at fixed interval	social reward given at random rather than fixed interval	responds to "look" whenever so directed but still requires reinforcement at random intervals
(12) sustains visual attention to objects after being verbally directed to "look"	reward given only when, without verbal cue, the learner scans the environment and fixes attention on the stimulus object	attends visually without the need of verbal prompt

Training Imitation (Stage III)

Learner's Behavior	Teacher's Response	Expected Change in Learner's Behavior
(13) sustains visual attention to objects in his field of vision	random social reinforcement of attending response	no change
(14) looks at but does not interact with object of visual attention	demonstrates activity (e.g. push a truck) and tells learner "you do it"	no change
(15) watches teacher interact with toy but does not imitate	demonstrates, directs learner to imitate, physically guides him through the activity, and rewards this passive imitation	increase in learner's ability to interact with the toy
(16) interacts with stimulus if the teacher provides a physical prompt but does not imitate teacher's actions	reward given only for successive approximations to the task demonstrated by the teacher	directed to imitate, the learner does so with only minimal assistance from the teacher (e.g. guiding his hand in the direction of the stimulus
(17) when verbally directed to imitate (i.e. "you do it" the learner repeats the teacher's actions in anticipation of receiving a primary reward	using a variety of toys and actions the learner is moved from primary to secondary rewards and from a fixed to a random reinforcement schedule	after a teacher demonstration the learner consistently responds to the direction "you do it" (for more complex actions (e.g. hand washing) it may be necessary to analyze the activity into its simpler components)

The following simple tasks are suggested for use in teaching a youngster to imitate:

1. Pat-a-Cake
2. stirring with a wooden spoon or paddle
3. banging sticks, utensils or blocks
4. scribbling

5. finger painting

6. pushing a ball or wheeled toy away from the body

7. waving or shaking a noisemaker (e.g. bell or rattle).

Having mastered the ability to attend to the instructor, learning to imitate is but one of the branch skills to be mastered. As important to future learning is the child's ability to respond to key phrases such as "show me", "give me" and "where does it go?". It is suggested that the teaching of appropriate responses follow a pattern similar to that described for imitation (i.e. reduction of cues provided by the teacher).

Activities for Developing Body Awareness

When the severely handicapped youngster enters an educational program he is often unaware of himself as an individual and must be taught to respond to his name and to recognize himself in the mirror. At a later stage, the child might be taught to choose his own photograph from a field of increasing number and, still later, to identify himself in a group picture.

Along with this growing sense of self-awareness is the need to develop body awareness; the names and relative position of body parts, the consequences of body movement through space. Below are listed just a few of the many activities which might be used to provide severely physically limited children with a sense of body awareness.

Awareness of Body Parts

The ability to recognize discrete parts of ones own body and to name these units is a skill important not only for further cognitive development but also for communicating information about physiological needs and distress. For ease of learning, it is suggested that names of body parts be taught one at a time with the youngster first identifying and later naming each part. Children without functional speech should be taught to use pictures as an alternative to verbal labels.

Activity I. Name each body part as it is stimulated by handling. Patting, rubbing, stroking, and poking are alternatives which might be used. Either the instructor's or the child's own hand can be used.

Activity II. Stimulate body parts using different textures and/or temperatures (e.g. terry cloth, fur, sponge, ice).

Activity III. While dressing the child, or using a doll, the teacher says: "Here is J's (the doll's) sock. It goes on his foot. Show me his foot."

Awareness of Body Movement

Initial awareness of body movement is expanded as the individual learns to maneuver his body in space. Through movement he acquires a framework for understanding the concepts of space and time. By encouraging the individual in primitive independent movement, one provides increased opportunity for the exploration of the environment.

Activity I. Supplement normal kinesthetic feedback with auditory feedback by having the child wear noise-making rings, anklets, bracelets, etc.

Activity II. Simple songs and games requiring hand play and gesture can be used to provide opportunity for guiding the child through new movements (e.g. Pat-a-Cake, If You're Happy and You Know It, Indian Chief, Follow-the-Leader).

Activity III. Provide opportunity for the child to roll in both directions, on a variety of surfaces, up and down inclines. A barrell may be used to help the youngster who has trouble. The barrel allows the child to experience the same feelings he would have if he were doing the rolls himself.

Activity IV. Use of a seesaw, tilt table, trampoline or swing provides the individual with experiences in which he is forced off balance and needs to recover equilibrium.

Activity V. Obstacles placed in varying patterns help children improve their concepts of depth, direction and time. The obstacle course can be varied in accordance with the method of movement available to the child.

Developing Eye-Hand Coordination

Coordinated use of hands and eyes is a major problem for severely handicapped children. Use of reflex inhibiting postures may be used to facilitate optimal performance when training the youngster in visual and/or hand skills and additional prosthetic support may be needed.

It should be remembered that in the early stages of learning the hand will lead the eye. Therefore, it is suggested that attractive stimuli be placed directly into the child's hands. As the child progresses his eyes will begin to guide his hands and stimuli should be provided which encourage reaching, touching, and grasping of objects. The teaching of activities of daily living such as zipping, buttoning, tying, snapping, or using velcro tabs can be used as a means of improving overall eye-hand coordination.

Activity I. Hand games (e.g. Pat-a-Cake, Clap Hands) and multi-sensory feedback provided by bells, rattles, etc. draw the child's attention to his own hands.

Activity II. Games such as Peek-a-boo and "Where is it? There it is!" facilitate visual searching and scanning of the visual field. (External control of the head may be necessary to encourage visual pursuit).

Activity III. The use of suspended objects which move easily or produce a sound when hit encourage coordinated use of eyes and hands.

Activity IV. Use of graphic media such as finger paint, pudding paint, chalk, etc. focus the child's visual attention on the activities of his hands.

Activity V. Dropping objects into a container provides opportunity for grasp and release as well as for development of eye-hand coordination. The size of both the container and the objects to be deposited therein can be altered to provide varying experiences.

Activity VI. Hand prints are placed on the floor for the individual to follow while creeping. Children who have not as yet mastered independent creeping might use a scooter board or be assisted by an adult.

Activity VII. Water and sand play activities which include pouring, spooning, filling and emptying provide practice in coordinated use of eyes and hands.

Activity VIII. Use a large peg board to teach more refined coordination of visual input and fine hand movements.

Activity IX. Hide objects of desire (the reward) in a box, one side of which is a zippered, fastened or buttoned cloth. The reward inside motivates and rewards the child for his effort. Be certain the box is oriented so that unfastening requires movements similar to those required for unfastening worn clothing.

For the individual who has neither functional speech nor the ability to use his hands in a consistent pointing response, visual tracking and fine co-ordination of eye motion becomes extremely important. For this individual the focus is less directed toward eye-hand coordination. Rather, the emphasis is on visual tracking (i.e. extending range of motion) and on the ability to coordinate visual input with a prosthetic interface or signal system (e.g. buzzer, bell, pressure switch).

Activity X. Teacher pushes a toy through a series of tunnels. The learner signals when the toy enters the tunnel and again when it exits. The use of two different signals is the first step in the learning of a binary communication system.

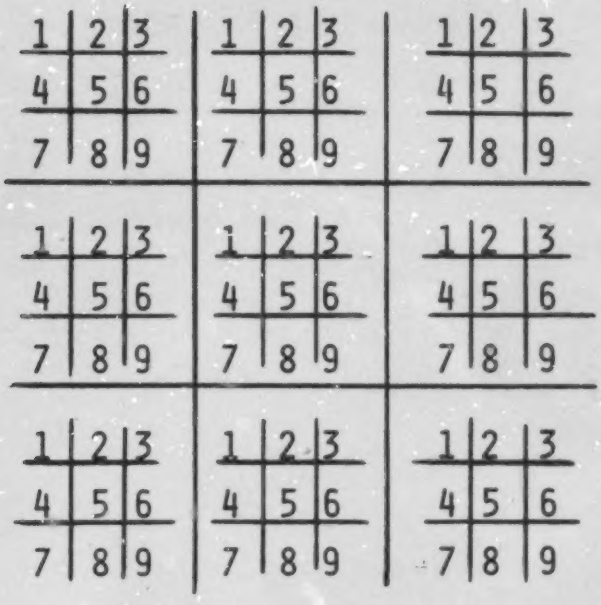
Activity XI. Present a row of attached boxes, one of which containes a "prize". Learner follows a light or moving objects as it passes each box. If the learner signals when the target is reached he wins the prize.

Activity XII. Given a stimulus picture and a board with alternatives, the learner signals when the teacher points to the matching picture on the board.

Activity XIII. Given a three by one matrix the learner communicates his response by using only his eyes. Slowly this format is extended in complexity so that in the three by three matrix below, the student indicates box three by first glancing upward (top row) and then glancing to the right (last column).

1	2	3
4	5	6
7	8	9

A system such as this one can be extended to allow the student a choice of eighty-one alternatives by completing a board similar to that shown here.



On a functional board the numbers would, or course, be replaced by words or symbols which are meaningful to the child.

Activities for Improving Visual Perception

Having learned to attend to visual stimuli, the severely handicapped individual must often be directly taught to track and search for moving objects and to distinguish between objects. As an early goal, youngsters are taught to discriminate between two objects and/or pictures of objects (i.e. matching identities). At later stages the child might be taught to scan a number of alternatives and identify the stimulus item.

It should be noted that the exercises in this section rely heavily upon a multiple choice format. The mode of presentation can, of course, be changed to meet the needs of a given child. As a minimum requirement, however, for any of the examples given, the child must have a consistent and reliable affirmation-negation system. Generally, the complexity of any task may be increased or decreased by varying any of the following: (a) the concreteness of the material presented, (b) the number of alternatives, (c) the similarity between alternatives, (d) the distractibility of the environment in which the task is presented, and/or (e) the latency period between presentation of the stimulus and request for a response (delayed recall).

For the student with no previous experience, the matching of identical objects is usually the first skill to be mastered. Over time, the pupil is taught to transfer this skill to the matching of identical pictures as well as to the matching of similar objects, pictures, and objects with pictures. Sorting can be introduced when it is felt the individual is ready to work with a greater number of stimuli. Once the matching and sorting of objects has been learned, activities should begin to focus upon visual recognition of color, size, shape and number. Visual recognition of similarities and differences in direction and spatial relationships appears to develop much later.

As the youngster learns to make distinctions regarding his visual environment, new vocabulary is introduced. Exercises may require that the child identify an object which has been named or that he label an object which has been presented to him. The primary focus, however, should be upon acquiring meaning from visual input.

Activity I. Card games such as Old Maid, Concentration, and Go Fish lend themselves to both individual-teacher and group practice of matching skills.

Activity II. Lotto/bingo games can be easily modified to provide practice at all levels.

Activity III. Play postman games in which the object/picture (the address) must be delivered to the box with the same address.

Activity IV. Set up a play store the preparation of which requires that each child put his item with matching items in the store. The game can be extended so that children go to the store to "buy" that item pictured on their shopping lists.

Activity V. Use self-correcting form boards and puzzles.

Activity VI. Dressing dolls as twins provides the opportunity for practice in matching color, shape, and/or overall design. The teacher dresses one doll and the learner makes the second doll match. Using paper dolls allows the teacher to design new wardrobes as needed and makes it easier to apply this activity at various levels of difficulty.

Activities for Improving Auditory Perception

At the attention and awareness level, the severely handicapped youngster is taught to respond to the presence of sound in the environment. While training tasks may begin with attention to environmental sounds, the ultimate objective is that the child respond to meaningful speech. Slowly, he will be brought through stages in which he recognizes similarities and differences between words and can attach meaning to those words. Sentences acquire meaning and the individual can understand and follow simple directions. As the auditory symbols representing increased numbers of concepts are mastered, they become available for use in encoding and the individual learns to communicate his needs and desires.

Some of the activities in this section rely upon associating auditory with visual input. For the handicapped youngster with severe visual impairment, one might consider modifying the task so that associations are made between auditory and tactile concepts with which the child is already familiar. The complexity of the tasks presented can be controlled by changing: (a) the degree of familiarity with the sound presented, (b) the number of stimuli presented, (c) the similarity between alternatives, (d) the level of background noise, and/or (e) the period between stimulus onset and call for a response.

Activity I. In a room with background noise, the learner signals the onset and/or cessation of a stimulus environmental or speech sound.

Activity II. Learner performs an activity or points to a picture of the activity in response to hearing the word (e.g. jump).

Activity III. Teacher reads pairs of words and learner indicates wether the words are the same. A similar activity can be played using environmental sounds.

Activity IV. Simple Simon games using only verbal commands focuses attention on following directions. For the child with extreme motor limitations this can be modified so that it becomes a "show me" game using a communication board.

Activity V. Sound bingo using a record or tape provides experience with sounds common in the learner's environment (e.g. telephone, running water, television, human voice). The student either identifies the sound by name or, if able, marks a bingo-type card.

Activity VI. Word bingo can be played as a variation on sound bingo. The teacher reads a word and the learner marks the corresponding picture. The game can be played at more advanced levels by reading a descriptive phrase or sentence.

Activity VII. Memory for auditory stimuli can be facilitated by playing simple sound sequencing games (e.g. We went on a picnic and we brought ...) which require that the student remember a gradually increasing series of related words.

Basic Concept Formation

Slowly, the severely handicapped youngster learns to identify the visual and auditory stimuli in the environment. With continued educational programming this knowledge can be extended and applied to the needs of daily living. The student should be taught to sort items on the basis of meaningful functional characteristics (e.g. edible versus inedible, safe versus dangerous) and to associate objects that are action related (e.g. soap and water). Basic concepts of space, quantity, and time may also be introduced. And, at each level, new vocabulary are presented for mastery. With support, even some severely handicapped youngsters may learn to decode sentences of increasing complexity.

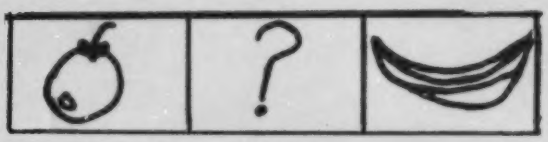
Activity I. Have children sort through magazine pictures with a focus on a given category (e.g. clothes, toys). The pictures can then be used to make a collage or mobile.

Activity II. Present pictures of a number of situations. Sort according to whether the setting is safe or dangerous. Prepare a chart for future reference. Whenever possible, pictures should relate to the child's immediate setting. For example, toys left in the middle of the floor or a wheelchair at the top of a stairwell about to be pushed forward might be suitable pictures.

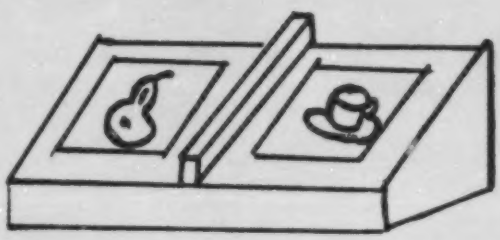
Activity III. In role play or actual meal setting assign a food monitor and a utensil monitor. Also assign a helper whose job it is to prepare for the two monitors be separating the food from the utensils.

Activity IV. Snack or meal time can be used to teach differences among categories of food.

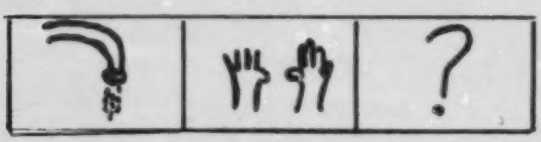
Activity V. What goes with these? (functional relationship)



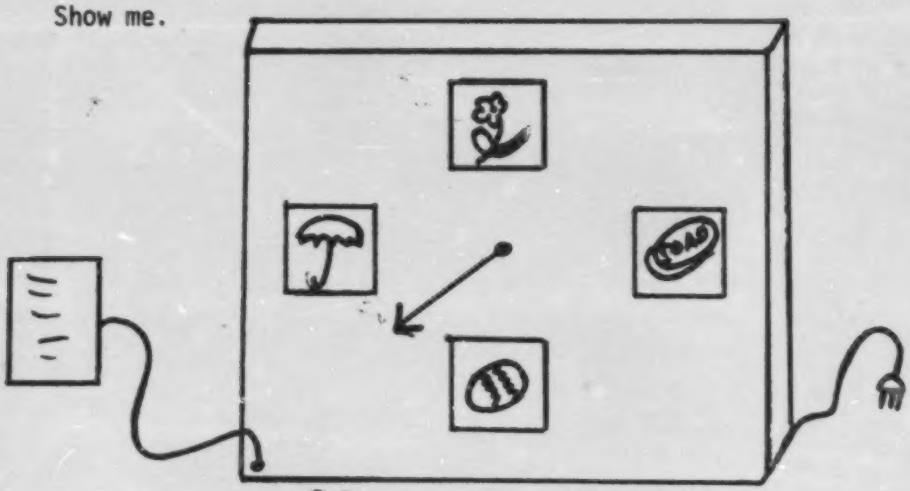
Show me.



Activity VI. What goes with these? (action agent relationship)



Show me.



Activity VII. Select a category and read a list of words. Learner signals when a word is read which does not belong in the given category.

Activity VIII. Describe a setting or situation. Learner selects the picture which best matches the description.

Activity IX. Card games which involve matching by category rather than on the basis of pure visual match can be used to provide individual or group practice.

Activity X. Bingo with pictures of items which are associated by function or by an action agent may prove useful for practice in memorizing basic concepts.

Activity XI. Category Lotto

Activity XII. An object which the child considers a reward is hidden. The location is then described to the child using spatial and directional terms.

Activity XIII. An object which the child considers a reward is hidden in a spot which is easily located. To earn the reward the student must describe the exact location. For example: "The candy is under the table, next to the door."

Activity XIV. Bingo using terms of quantity, direction, space, and time can be developed.

Developing Communication Skills

by

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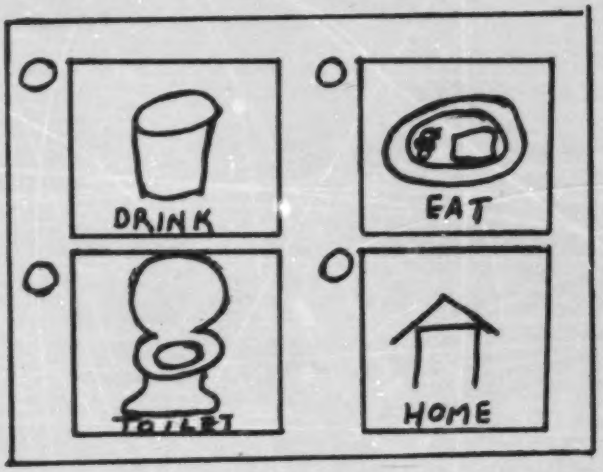
The activities presented in this section are intended as guides for program planning. They are geared toward remediation of various levels of speech/language disability and should be modified according to the needs of the individual child. Appropriate positioning of the child during all speech and language activities will enhance respiratory-phonatory-articulatory functioning and increase the child's opportunities to observe events occuring in the environment.

Use of Communication Boards

As mentioned previously, many severely physically handicapped children are unable to coordinate the motor-speech complex well enough to produce speech. For this reason, communication boards have been developed to increase the child's ability to express basic needs and thoughts.

Activity I. The goal of this activity is to increase the child's ability to discriminate between four messages on a communication board.

Materials needed include: a plywood board sized to fit the child's wheelchair or worktable; plastic or plexiglass cover for the board; four pictures, words, or symbols placed on large cards; four small noisemakers (e.g. bell, buzzer). Simple boards may be arranged as shown below.

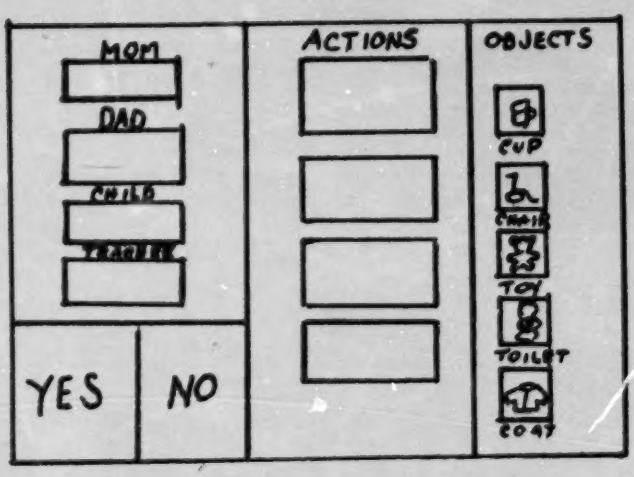


The teacher begins the activity by introducing each picture and associating it with its meaning (e.g. introduce "eat" and "drink" during lunchtime). The child's hand may be placed on the picture during these activities. When all four concept-picture relationships have been introduced, a game is played

in which the child rings the sound-maker over the message that is requested by the teacher. This is often enjoyable for the child and may iad in further discrimination of the four messages. Eventually, the noisemakers may serve at "attention getters" when the child initiates a message. Vocalization during message identification should always be encouraged and quickly reinforced by the teacher.

Activity II. Many children who are using communication boards have a large daily vocabulary. Increasing motivation to use their boards may be accomplished by giving them an active role in board design and vocabulary choice.

It is the teacher's function to guide the child in choosing appropriate items from books, magazines and friend/family photographs. When these have been collected, the child may require further assistance in categorization of items (e.g. classes of people, objects, actions). After items have been categorized, the child may choose a color cue for each category. These colors are then painted on the base of the board to assist the child in locating the words needed for a specific message. Selected pictures are attached in the appropriate section and are covered by a plastic sheet for protection. Arrangement of the board as shown below allows for agent-action-objects construction and reinforces left to right movement.



Development of Tense Markers in Language Production

Confusion in the concept of time may be reflected in the child's language production. For the child who has reached the stage of encoding syntactic utterances, this may be reflected in his use of "today", "tomorrow" and yesterday" as well as in omission or confusion of tense markers such as "-ed" and "-ing". In addition, the child may be unable to verbally sequence events occuring in his environment.

Activity I. The goal of this activity is to increase the child's concept of time progression and to introduce the labels "today", "yesterday" and tomorrow" and appropriate tense markers. Materials for this activity include: paper measuring six feet by two feet; pictures and photographs of past, present, future events.

Attach a "time line" to the wall of the room. Pictures of the child's activities are presented to the child and are placed on the time line in a "yesterday", "today", "tomorrow" progression. (Time periods may also be distinguished by color on a time line.) After each picture is discussed and positioned on the time line, teacher and child start from the "past" position and again sequence the activities. Appropriate tense markers should be consistently included in the teacher's discussion and should be used for labelling. The teacher may require the parents' help in collecting appropriate pictures and photographs for use in this activity.

Activity II. The goal of this activity is to increase the child's ability to verbally sequence events in which he has participated.

The teacher assists the child in the planting of a bean sprout; labelling each step of the process. When the activity has been completed the child verbally sequences steps involved. Some children may require picture cards of each step as an adjunct to verbal sequencing. As the plant grows, the child resequences all of the steps from the beginning of the activity. This task can be repeated with sequences involved in making pudding, cookies, art projects, etc.

Development of Concepts and Labels for Location

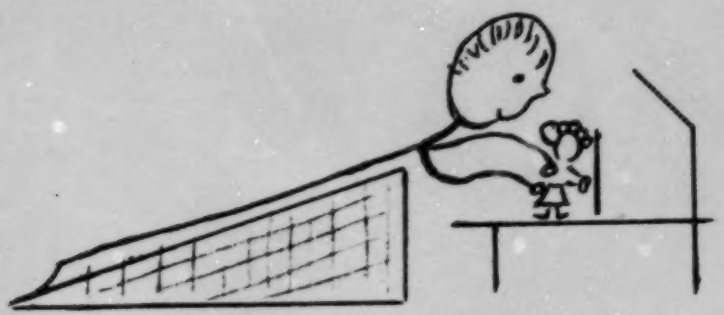
Many physically handicapped children have poor concepts of location and experience difficulty in decoding and encoding these concepts in ongoing conversation. This restriction may be related to an inability to move objects through different positions in space as a result of physical involvement.

Activity I. The goal of this activity is to increase the child's recognition of concepts and labels for "on top of", "inside", "under" and "beside" A wedge or prone board may be helpful in repositioning some children so that hands are free to move through space. (Consultation with the physical or occupational therapist may assist the teacher in determining most appropriate positions and equipment.) Materials needed include: large box on legs, doll or large toy.

The teacher assists the child in moving the doll into different locations in relation to the box. As the child puts the doll in different positions, the

teacher may label the location (stimulus) as the child moves the doll into the requested position. Completion of this final portion of the activity will provide evidence of goal achievement.

Activity II. For the child who is able to encode syntactic utterances, the above activity may be adapted to the goal of increasing the child's ability to label locations. Using the same materials from Activity I, the teacher moves the doll into different positions on the box and the child is required to label the location of the doll. Comprehension of the concepts and label of location must be established before proceeding to this activity.



Training in Social Perception

The ability to make social judgements is normally acquired without specific training. Through maturation and experience, the child of average ability learns to make sense of facial expression, voice quality, and gesture. He acquires tact and manners and learns to anticipate the consequences of his own actions.

A combination of factors contribute to the failure of the severely handicapped youngster to develop social-adaptive mechanisms. Chief among these is his poor ability to see and understand abstract relationships. Unless specifically taught to do so, the handicapped child cannot interpret the feelings of others from his observation of their non-verbal behavior. Without assistance, he fails to learn that feelings, attitudes, and intentions are revealed through gesture.

Training in social perception requires verbalization and interpretation of the non-verbal world. The tasks outlined in this section focus upon the interpretation of non-verbal actions as well as upon drawing relationships between events and non-verbal expressions of emotion. When a severely handicapped child enters an educational program, affect is often no more than an expression of basic needs and drives. Higher levels of emotional development would appear to be dependent upon the teacher's ability to pair these basic emotional drives with concrete representations (e.g. pictures, verbal labels) which can be used for further training.

The activities which follow are intended to provide examples of how the teaching of social awareness might be made more concrete. A number of tasks are presented in two formats: one with visual input and another with auditory

input. Either or both approaches can be used depending upon the child's needs and abilities. To increase or decrease the complexity of any task it is suggested that the reader follow the format outlined in the section on visual perception.

Activity I. Match simple pictures showing facial expressions.

Activity II. Using pictures, dolls, puppets, etc. have the learner choose the facial expression which corresponds to the word given. Easily pictured are happy, sad, surprised, worried, and angry. For those who have difficulty drawing faces, pictures cut from magazines work equally well.

Activity III. Learner matches the teacher's tone of voice with corresponding facial expression or labels the emotion being enacted.

Activity IV. Given a picture or verbal scenario, (e.g. a person looking at a car with a flat tire) the learner is to name or point to the facial expression which matches the mood of the incident.

Activity V. Two-man seesaw engages the student in an activity with a second person.

Activity VI. Many severely handicapped youngsters have never experienced a group play setting. Responses to being in this new situation vary. Some children may become hyperactive while others "drop out" and are unable to engage in either individual or group play. Outlined below is a brief plan for teaching a youngster to play with other children.

Learner's Behavior	Teacher's Response	Expected Change in Learner's Behavior
(1) runs around the room or sits inactively by self	ignores learner while attending to and praising those children who are engaged in play	random engagement in a play activity
(2) engages in individual play at random intervals	primary reward or praise and attention given when learner is engaged in a play activity	increase in time in which learner engages in quiet individual play
(3) stabilized ability to play by himself while in an active room	reward learner only when he plays by himself near others	increase in percentage of time spent playing near others
(4) plays near others in anticipation of attention from the teacher	reward only during those periods when learner is attending to play of another child	increase in percentage of time spent attending to the play of others
(5) shows interest in the play of others	engineer a situation in which learner plays with another and reward heavily for joint participation	increase in time spent playing with other children in a planned situation

Learner's Behavior	Teacher's Response	Expected Change in Learner's Behavior
(6) will engage in group play if so arranged by the teacher	reward only when voluntarily engages in group play	increase in percentage of time in which self-decision is made to engage in play with another

Multipurpose Activities

As noted earlier, severely handicapped youngsters manifest rates of learning which are particularly slow. Once new skills have been acquired through direct teaching, constant repetition and varied practice are necessary components of the educational process. At initial learning stages, activities focus on a single learning area. As the individual masters single skills they are then combined with skills from other areas and practiced together.

Often, practice can be incorporated into a game-type or play format. If the children are able to work in small groups of two or three, social interaction can be encouraged while other developmental skills are being practiced. The teacher should, however, be certain that the activity has educational meaning for each of the youngsters participating. It is unfair for a severely multiply handicapped child to spend time participating in an experience that has no meaning for him; he hasn't the time to waste.

Embedded in each of the following activities are a variety of learning opportunities. Each skeletal plan is intended as an example of the way in which a single activity might be "milked" (i.e. all opportunities for teaching/learning are utilized to the fullest extent).

Basic Activities - Music, Art, and Gross Body Movement

Submitted by Sally W. Ruggia, Educational Therapist
Dallas Society for Crippled Children, Texas

Music Activities. Music can be used in a variety of ways. Songs may be used for concept development as well as to encourage social interaction. Examples include the following:

1. The Little White Duck - animal names and sounds, colors;
2. Five Green Bottles Standing on the Wall - counting, subtraction;
3. The ABC Song - letter names;
4. Me (Taylor, 1972) - self-concept development;

Rhythm instruments are useful in structured situations and might be made available during "free time" as well. The severely handicapped child can wear a bell-bracelet on wrist or ankle, or move a rattle held in his hand. If properly positioned, the youngster may be able to hit a drum or tambourine with minimal assistance. Each child should be encouraged to join in singing with whatever sounds he can produce.

Art Activities. Most severely handicapped children are able to engage in fingerpainting and can make interesting designs with minimal motion. Be certain to inform the child that he is about to get his hands dirty. (Whenever possible solicit the child's permission). A blob of liquid starch, a squirt of dishwashing detergent and a sprinkle of powdered tempera make an easily cleanable fingerpaint. Interesting effects can be obtained by painting on the table and making a print by lightly pressing paper on to it.

Painting activities are ideal for discovering what happens when you mix colors. (Water in clear glasses and food coloring provide another facinating approach to this topic). Painting with tempra and big brushes at the easel can also be satisfying. Many severely handicapped children can move the brush if it is held for them or fastened to their hands. Head gear to which crayon or brush can be attached offers another possibility for semi-independent art work. It is suggested that one adopt a policy to "Let it be the child's own work, even it it's just a few strokes". It will mean much more to him and his family than something more elaborate which has been produced with too much "help" from the teacher.

Mosaics of various types offer fun for seasonal projects. Old greeting cards cut into irregular shapes 1 inch to 1½ inches in size can be used to make a butterfly or flower for a Mother's Day card or gift, or a bell or star for a Christmas decoration. Colored popcorn, beans, or seeds can be used to fill in a simple outline of a turkey, leaf, or hand print to make attractive decorations and keepsakes. If the child lacks the fine motor control needed to pick up one piece at a time, a scoop or spoon is usually helpful.

Even if movements must be guided by the teacher, the very severely involved child can experience the feel of paste on his fingers and the motor pattern involved in patting down the piece. Simple group pasting projects may include color posters (search magazines and tear out green, red, or blue things), food posters or people posters. Making chains often provides a good group project with some children marking lines with a ruler, some cutting, some pasting, and some "holding" or "supervising".

Brown paper bags become masks for Halloween or Indian vests for Thanksgiving. While it may be necessary for an adult to do the initial cutting, children with multiple involvements are usually able to do the decorating with crayon or paint.

A number of trace, cut and paste projects have been successful with severely handicapped children. Styrofoam meat trays make excellent patterns. Projects might include ornaments for the bulletin board, feathers for the November turkey, and shapes for shape pictures. (Two triangles make a kite. A circle and a triangle make an ice cream cone. A square and a triangle make a house). The severely involved child can trace and feel the shapes even when his hands must be guided by the adult.

A usually successful project is body pictures done as a part of a unit on self-concept. The child lays on the floor while a picture is made by tracing around the body. Appropriate clothing and features are then added. Children seem to particularly enjoy coloring in the clothes since the area

is large and they are able to work on the floor. Side-lying is a good working position for this activity. The finished pictures can be measured to compare heights for a discussion of size.

Gross Motor Activities. All too often gross motor activities are not even considered for the severely physically handicapped child because of his severe motor limitations. But, such activities, properly facilitated, can provide much satisfaction and excitement for these children.

Materials need not be extensive or expensive. Excellent investments include a rubber beach ball (18 inch diameter) and a hula hoop. The severely involved child can play basketball if side-lying on the floor, next to the hoop with the ball positioned so that it can be hit into the hoop-basket. The hoop can also be held vertically so that the ball can be rolled or thrown through the hoop. As a group activity, several children either standing or sitting can hold the hoop to make a basket for another child. The hoop is also fun for a child to crawl or wiggle through.

Bean bags in assorted sizes, shapes and colors (reinforce these concepts when using the material) can be sued to facilitate hand-eye coordination. Targets might include a wastebasket, shallow plastic dishpan, or the multifunctional hula hoop. The children project their bean bags at the target in any way they can.

A cast-off tire can be used as a tunnel through which to crawl or a target through which to throw a ball. When used to sit in, the tire provides just enough support for many of the children who need work on strengthening trunk and head control.

A small parachute can also provide hours of fun for a multiply impaired group. It does, however, require an adult for each severely involved child. The children sit around the outside edge of the parachute, holding it in both hands; moving it up and down to make waves. It is fun to walk, crawl, roll, or otherwise navigate across this "sea of waves". Keeping a light ball or balloon afloat can also be a challenge. Larger motions make bigger waves. If the children sit in chairs or stand, it is possible for one child to run (or be pushed) under the parachute while it is in the air. Releasing the parachute while making big waves results in an exciting mushroom effect.

Going outside is always exciting even if it simply means a ride around the play yard in a wagon or rolling down a grassy hill. Scooter boards provide an independent means of navigation for those children who would otherwise skin knees dragging them along the hardtop.

Basic Activity - Design Printing

Suggested by Joyce Bacalao, Special Teacher
Caracas, Venezuela

Procedure. Print a design on construction paper by using wet paper towels and food coloring as the print media. Wet toweling is laid flat and the food coloring is drizzled over it to make runs of color. When the construction paper is placed over the wet towel and pressed, a "print" is made.

Component Skills. The following skills can be practiced:

1. Tactile Discrimination - feeling the difference between the wet and dry areas of the paper towel;

2. Visual Discrimination - seeing the difference in appearance of the wet and dry areas of towel;

3. Finger/Hand Control - the wet towel must be handled gently to avoid ripping, bottles of food coloring must be squeezed hard enough to force out the liquid but gently enough to control output, and finger extension and hand control are needed to press the construction paper over the design for printing;

4. Color Discrimination - asking for the color wanted from a field of alternatives.

Possible Modifications. The following modifications may be used to either decrease or increase the difficulty of the task:

1. alteration of the child's position to facilitate use of the hands at midline;

2. transfering of food coloring from the original container into a more easily controlled squeeze bottle (i.e. larger, smaller, more flexible);

3. transfering the food coloring into bottles from roll-on deoderant for those children who cannot master the grasp-release movement needed for a squeeze bottle;

4. placing the towels while still dry and using a squeeze bottle to dampen with water once the towel is properly placed;

5. having the child select from alternatives that color which is named by the instructor;

6. giving specific requests with respect to particular colors being dripped on particular sections of the towel (e.g. red in top right corner).

Basic Activity - Stringing Beads

Suggested by Kathleen R. McCann, Special Teacher
Scottsdale, Arizone

Procedure. Copy bead patterns of varying colors, shapes and sizes from

a model displayed.

Component Skills. A bead stringing activity provides the opportunity to practice the following:

1. color, shape, and size matching;

2. visual scanning of sequence;

3. eye-hand coordination.

Possible Modifications. The difficulty of this task can be altered by using one of the following modifications:

1. Substitute a coat hanger, shoe lace, or plastic strip in place of the string.

2. Use an alternate respond mode for those children whose physical limitations prohibit them from learning to string beads. Suggested are (a) placing the beads in proper order on a flat surface, (b) use of a head pointer to arrange the beads or to indicate which is next, (c) berbal ordering, and (d) affirmation or negation of the instructor's choice.

3. Copy from a picture.

4. Reproduce from memory of a model or picture.

5. Reproduce the pattern from verbal cues (i.e. descriptions of position, color, shape, and size).

6. Give the student just those beads needed to copy the given sequence.

7. Present a repetitive sequence which the student must complete on his own.

Basic Activity - Creating a Mobile

Suggested by Adrienne S. [illegible]an, Special Teacher
New York, [illegible] York

Procedure. Given verbal directions (e.g. put the long red piece after the blue one) the student ties pre-cut strips of fabric over a hanger. Fabrics should differ in color, texture, length, and width to allow for experiences with a variety of concepts.

Component Skills. Opportunity is provided for practice in the following areas:

1. Visual Discrimination - selecting color and/or size as verbally directed by the instructor;

2. Tactile Discrimination - selecting texture as verbally defined by the instructor;

3. Discrimination of Spatial Relationships - placement of fabric strips in the order dictated by the instructor (e.g. put the green one between the red strip and the blue one);

4. Eye-Hand Coordination - bilateral use of hands at midline to tie the fabric and coordinated use of eyes and hands to scan alternatives and select the strip which has been requested.

Possible Modifications. While the basic activity remains the same, task requirements in each of the skill areas can be modified to meet the needs of different children.

1. Visual Discrimination: (a) copy a model or picture, (b) learner selects colors/sizes of choice but must label his choices, (c) sequence strips of fabric in a repetative color or size pattern, (d) sequence strips by gradation in color, (e) sequence strips by gradation in length or width;

2. Tactile Discrimination - (a) copy a model, (b) select texture of choice but give label, (c) alternate soft and rough textures;

3. Discrimination of Spatial Relationships - (a) copy a model going from left to right or from top to bottom, (b) learner describes the position of fabric pointed to by instructor;

4. Eye-Hand Coordination - (a) position the hanger above eye level to encourage arm movement, (b) stabilize the hanger to make knotting easier for either an amputee or a client with poor use of arms and hands, (c) position the hander to encourage arms crossing the body at midline, (d) fasten the fabric to the hanger by twisting several times instead of knotting, (e) have student cut his own fabric strips.

Basic Activity - Making Paper Decorations (I)

Suggested by Madhavi B. Sethna, Teacher
Potsdam, New York

Procedure. Place two strips of paper of equal width at right angles to each other and glue in place (Figure 1). Repeatedly fold the bottom strip over the top on (Figures 1 and 2). When the ends of the stips are reached, glue together. The plaited strips form a chain decoration.

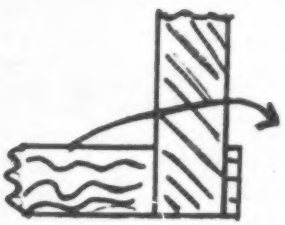


Figure 1

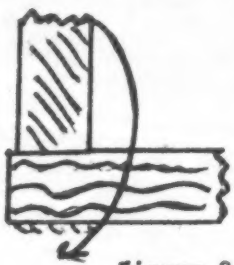


Figure 2

Component Skills. The skills and knowledge to be emphasized in this arts and crafts activity are dependent upon the manner in which the task is presented to the learner. It can be a simple paste and fold task as described above which incorporates spatial relationships and eye-hand coordination. It can, however, be extended to include:

1. Size Discrimination - From alternatives, have the learner select two strips of identical width.

2. Color Discrimination - From alternatives, have the learner select two strips which (a) are identical in color, (b) differ in color, (c) have been named by the instructor, (d) have been chosen and named by the learner, or (e) are different shades of the same color.

Possible Modifications.

1. Have the learner cut his own strips of paper using training scissors as needed.

2. Use glue stick or transfer liquid glue to a plastic roll-on deoderant bottle for ease of application.

3. Stabilize the starting ends by taping to the work surface. This allows the learner to use both hands for folding if necessary.

Basic Activity - Making Paper Decorations (II)

Suggested by Madhavi B. Sethna, Teacher
Potsdam, New York

Procedure. Fold a rectangular sheet of paper in half. Beginning at the fold make a cut extending to within ¼" of the open end. Turn to open side and repeat. Continue cutting as shown in Figure 1. Unfold the paper and pull as shown in Figure 2.

Figure 1

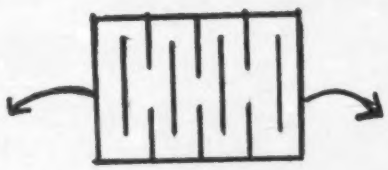


Figure 2

Component Skills. The skills to be learned in this cutting activity concentrate upon:

1. Eye-Hand Coordination - folding and cutting;

2. Spatial Discrimination - experience is provided with the concepts of top, bottom, and equidistant.

Possible Modifications.

1. Use training scissors, electric scissors, or regular scissors which have been modified so that one of the finger grips is anchored so that only one finger need be moved downward to effect cutting.

2. Anchor the paper so that it need not be held by the child while he is cutting.

3. Vary the width of the paper so that cuts can be made one snip, two snip or three snips in length.

4. Draw lines along which child is to cut.

Basic Activity - Making Play-Dough

Suggested by Roberta M. Isaacson, Special Teacher
New Jersey

Procedure. Combine the following ingredients and knead. If the mixture is too grainy, add a small amount of oil and water as needed.

For five individual portions of play-dough:

1 cup salt
1½ cups flour
½ cup water
2 TBS. oil
food coloring

Component Skills.

1. Eye-Hand Coordination - pouring and transfering ingredients, kneading the dough;

2. Identification of ingredients provides opportunity to develop: (a) visual discrimination, (b) tactile discrimination, (c) taste discrimination, and (d) verbal labels for all of the above;

3. Understanding of relative and/or absolute amounts;

4. Color discrimination.

Possible Modifications. This activity is easily modified by altering the level at which any of the above discriminatory skills is presented. For example the learner might be expected to:

1. Match a given model;

2. Follow verbal directions given by the instructor (i.e. select a given from a field of alternatives);

3. Identify/name that which is presented by the instructor.

Basic Activity - Body Tracing

Suggested by Roberta M. Isaacson, Special Teacher
New Jersey

Procedure. Child's body outline is traced while he lies supine on a large sheet of paper. Outline is cut and features are added.

Component Skills.

1. Awareness of Body Parts - The period in which the learner is having his body traced and the final silhouette provide the opportunity to teach: (a) names of body parts, (b) relative position of body parts, (c) personal coloration of skin, eyes, and hair, and (d) special personal features such as a hearing aide or glasses.

2. Basic Concept Formation - Comparisons can be made to provide the student with experiences in relative height. Associations between clothes and body parts can also be taught.

3. Self-Awareness - Learner recognizes his own silhouette in a field of alternatives.

4. Color Matching - Learner matches graphic media with clothed real self.

Possible Modifications.

1. Child cuts out silhouette using special scissors if needed.

2. Learner adds features once the basic outline is completed.

3. Teacher draws outline of clothing which is then filled in by learner.

4. Cooperative work between two or more children.

5. Make extra sets of clothing (including underwear and outerwear) which can be pinned on the "doll" to teach associations between clothing and body parts.

6. Change facial expression to match child's mood.

SUMMARY

"There are no education laws similar to P.L. 94-142 in its insistence that state and local school systems establish policies of providing free public education for all of America's handicapped children by September 1978" (Martin, 1976, p. 133). As a result, appropriate programming for the severely multiply handicapped has received renewed interest. New and more precise developmental scales are being designed along with modifications in curriculum. Special projects funded by the Bureau of Education for the Handicapped are providing model programs.

The complex problems presented by severely handicapped children are reflected in the unique competencies required by teachers of this population. Brown and York (1974) suggested the following categories of skills to be mastered by teachers:

1. Techniques of managing severe behavior problems
2. Procedures for the development of teacher made instructional materials
3. The engineering of physical properties of classrooms
4. Basic principles of acquisition and performance
5. Basic principles and techniques of instructional measurement
6. Basic principles of imitation training, generalization, discrimination, and maintenance
7. Basic principles of task analysis
8. Development and implementation of instructional programs
9. Procedures used to develop curriculum sequences. (p. 6)

It is anticipated that teachers of crippled and other health impaired populations will bear a major portion of the responsibility for the education of severely and profoundly handicapped pupils. Continued professional growth in the aforementioned areas appears to be a significant factor in effecting meaningful educational opportunities for this group. As more special educators assume responsibility for severely involved populations, it is hoped that professionals will engage in self-assessment of skills and that self-study and/or formal re-training will be undertaken as necessary. As a first step in the assessment process, the methods and materials contained herein are intended to acquaint the reader with the scope of activities used to impart skills to severely handicapped students.

Handicapped children who are severely and profoundly disabled are dramatically different from both normal and mildly handicapped age peers. In the absence of specifically planned educational management it is not likely that they will learn to interact with the environment. The facilitation of improved cognitive function necessitates skill development in attention, visual, auditory, motor, social, and speech/language areas.

It should be recognized that no single teacher can be expected to be an expert in all of the therapeutic needs of severely and multiply handicapped populations. Effective educational programming requires a transdisciplinary effort. Combining efforts of team members in formulating an overall treatment program will best serve the physically, cognitive, communicative, emotional, and educational needs of the individual.

Whereas the traditional team approach divided the child's abilities and needs along disciplinary lines, the transdisciplinary approach attempts to assess the child's functioning as a whole and define areas of need in terms of overall program planning. One primary person carries out several professional roles while under the supervision of his colleagues; specialists from the fields involved. Because the teacher often provides the most frequent out-of-home contact for the severely physically handicapped child, he should be prepared to serve as coordinator and primary programmer within the transdisciplinary system.

Quality programming for the severely handicapped will, in large part, be affected by public attitudes and the ability of communities to allocate the funds necessary to secure services oriented toward the unique needs of the severely multiply handicapped. Until recently, most severely and profoundly handicapped were found in residential institutions.

It is becoming increasing evident that something can be done for the severely handicapped and, more importantly, that they can do something for themselves if they are provided appropriate educational services. . .To meet this challenge, BEH will continue to fund exemplary projects for the severely handicapped, provide technical assistance for programs under way, and facilitate greater accomplishments among the increasing number of agencies that are playing a role. . .We are learning that the severely handicapped are human beings who are demonstrating today that with the proper kind of training they can lead satisfying dignified lives. (Thompson, 1976, p. 142)

REFERENCES

Bateman, B. The essentials of teaching. San Rafael, CA: Dimensions Publishing Company, 1971.

Bayley, N. Bayley infant scales of development. New York: Psychological Corporation, 1969.

Berry, M. Language disorders of children. New York: Appleton-Century-Crofts, 1969.

Bigge, J. L. (Producer). Systems of precise observation for teachers. Washington, D.C.: National Audio Visual Center, 1970.

Bobath, K. The motor deficit in patients with cerebral palsy. London: Spastics International Medical Publications, 1966.

Brown, L. & York R. Developing programs for severely handicapped students: Teacher training and classroom instruction. Focus on Exceptional Children, 1974, 6, 1-11.

Chomsky, N. & Halle, M. The sound pattern of english. New York: Harper, 1968.

Cohen, M. Gross, P., & Haring, N. G. Developmental pinpoints. In N. G. Haring & L. Brown, Teaching the severely handicapped (A Yearly Publication - Vol. I). New York: Grune and Stratton, 1976.

Connor, F. P. & Baken, J. W. Designing materials for physically handicapped learners. In F. B. Withrow & C. J. Nygren (Eds.), Language, materials and curriculum management for the handicapped learner. Columbus: Charles E. Merrill Publishing, 1976.

Connor, F. P., Wald, J. R. & Cohen, M. J. Professional preparation for educators of crippled children. New York: Teacher's College, 1971.

Eimas, P. D. Linguistic processing of speech by young infants. In R. L. Schiefelbusch & L. Lloyd (Eds.), Language perspectives--acquisition, retardation, and intervention. Baltimore: University Park Press, 1974.

Finnie, N. R. Handling the young cerebral palsied child at home. New York: E. P. Dutton & Co., Inc., 1970.

Frankenburg, W. K., Dobbs, J. B., & Fandal, A. The revised Denver developmental screening test manual. Denver: University of Colorado Press, 1970.

Gessell, A. & Amatruda, C. S. Developmental diagnosis. New York: Harper, 1947.

Haring, N. G., Hayden, A. H., & Beck, G. R. General principles and guidelines in "programming" for severely handicapped children and young adults. Focus on Exceptional Children, 1976, 8, 1-14.

Langlois, A. & Baken, R. J. Development of respiratory time factors in infant cry. Developmental Medicine and Child Neurology, 1976, 18, 732-737.

Lindsley, O. Precision teaching in prespective: An interview with Ogdan R. Lindsley. Teaching Exceptional Children, 1971, 3, No: 3.

Lippman, L. & Goldberg, I. I. Right to education: Anatomy of the Pennsylvania case and its implications for exceptional children. New York: Teachers College Press, 1973.

Martin, E. W. A helping relationship: Federal programs for special children. Exceptional Children, 1976, 43, 132-135.

Meyers, D. G., Sinco, M. E., & Stalma, E. S. The right-to-education child: A curriculum for the severely and profoundly mentally retarded. Springfield: Charles C. Thomas, 1973.

Mysak, E. D. Neuroevolutional approach to cerebral palsy and speech. New York: Teachers College Press, 1968.

Robinault, I. P. Functional aids for the multiply handicapped. New York: Harper & Row Publishers, 1973.

Sailor, W. S. & Mix, B. J. The TARC assessment system (User's Manual). Lawrence, Kansas: H & H Enterprises, 1975.

Sontag, E., Burke, P. J., & York, R. Considerations for serving the severely handicapped in the public schools. Education and Training of the Mentally Retarded, 1973, 8, 20-26.

Stainback, S., Stainback, W., & Maurer, S. Training teachers for the severely and profoundly handicapped: A new frontier. Exceptional Children, 1976, 42, 203-210.

Taylor, B. Nobody else in the world likes me. In B. Taylor, Body Rhythmics. Dallas: Bernice Taylor Publications, 1972.

Thompson, R. P. The severely handicapped: A new horizon. Exceptional Children, 1976, 43, 141-142.

Vanderheiden, G. C. & Grilley, K. Non-vocal communication techniques and aids for the severely physically handicapped. Baltimore: University Park Press, 1975.

Wilder, C. N. & Baken, R. J. Respiratory patterns in infant cry. Human Communication, 1975, 3, 18-34.